

Claims

1. A method for performing a handover from a WCDMA network to a CDMA-2000 network by using a dummy pilot signal, the method comprising the steps of:

(a) receiving a WCDMA signal level measurement message at a multimode terminal, turning on a CDMA-2000 modem mounted on the multimode terminal and transmitting a level value of the dummy pilot signal to a WCDMA system, upon detecting the dummy pilot signal above a prescribed level out of the WCDMA signal level measurement message;

(b) determining whether to perform a handover or not based on the level value of the dummy pilot signal received from the multimode terminal;

(c) transmitting a handover request message from the WCDMA system to a CDMA-2000 system when it is determined to perform the handover;

(d) transmitting a handover command message from the WCDMA system to the multimode terminal; and

(e) allowing traffic to be switched to the CDMA-2000 modem of the multimode terminal.

2. The method as claimed in claim 1, wherein step (c) includes the steps of:

(c1) transmitting the handover request message from the WCDMA system to a protocol converter when it is

determined to perform the handover;

(c2) performing a protocol conversion for the handover request message at the protocol converter; and

(c3) transmitting the protocol-converted handover request message from the protocol converter to the CDMA-2000 system.

3. The method as claimed in claim 1, wherein the WCDMA signal level measurement message includes information on peripheral base stations which should be searched by the multimode terminal and information on the dummy pilot signal.

4. The method as claimed in claim 1, wherein the dummy pilot signal includes a WCDMA pilot signal.

5. The method as claimed in claim 1, wherein the dummy pilot signal is transmitted from the CDMA-2000 system located in a border area between the WCDMA network and the CDMA-2000 network.

6. The method as claimed in claim 1, wherein the dummy pilot signal includes a specific scramble code.

7. The method as claimed in claim 1, wherein the WCDMA system includes:

a radio transceiver subsystem (RTS) for receiving the

level value of the dummy pilot signal from the multimode terminal and transmitting the level value of the dummy pilot signal; and

5 a radio network controller for receiving the level value of the dummy pilot signal from the radio transceiver subsystem, determining whether to perform the handover for the multimode terminal, and transmitting the handover request message or the handover command message.

10 8. The method as claimed in claim 1, wherein the CDMA-2000 system includes:

a base transceiver station (BTS) for transmitting the dummy pilot signal to the multimode terminal; and

15 a base station controller (BSC) for receiving the handover request message from the WCDMA system.

9. The method as claimed in claim 1, wherein, at step (a), the multimode terminal periodically searches a common pilot channel (CPICH) and receives the WCDMA signal level measurement message.

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10. The method as claimed in claim 1, wherein, at step (d), when the multimode terminal receives the handover command message, the CDMA-2000 modem of the multimode terminal is turned on and a WCDMA modem of the multimode terminal is turned off.

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11. A method for performing a handover from a WCDMA network to a CDMA-2000 network by means of a WCDMA system for determining whether to perform the handover or not, a
5 CDMA-2000 system for transmitting a dummy pilot signal, and a multimode terminal including a WCDMA modem and a CDMA-2000 modem, the method comprising the steps of:

(a) receiving a WCDMA signal level measurement message at a multimode terminal;

10 (b) detecting the dummy pilot signal from the WCDMA signal level measurement message and comparing a level value of the dummy pilot signal with a predetermined threshold value;

(c) turning on a CDMA-2000 modem and transmitting the
15 level value of the dummy pilot signal to the WCDMA system, when the level value of the dummy pilot signal is larger than the predetermined threshold value;

(d) determining whether to perform the handover or not based on the level value of the dummy pilot signal at the
20 WCDMA system;

(e) transmitting a handover request message to the CDMA-2000 system when it is determined to perform the handover at the WCDMA system;

(f) transmitting a handover command message from the
25 WCDMA system to the multimode terminal; and

(g) allowing traffic to be switched to the CDMA-2000

modem of the multimode terminal.

12. The method as claimed in claim 11, wherein step (e) includes the steps of:

5 (e1) transmitting the handover request message to a protocol converter when it is determined to perform the handover at the WCDMA system;

(e2) performing a protocol conversion for the handover request message at the protocol converter; and

10 (e3) transmitting the protocol-converted handover request message to the CDMA-2000 system at the protocol converter.

13. The method as claimed in claim 11, wherein the WCDMA signal level measurement message includes information on peripheral base stations which should be searched by the multimode terminal and information on the dummy pilot signal.

14. The method as claimed in claim 11, wherein the dummy pilot signal includes a WCDMA pilot signal.

15. The method as claimed in claim 11, wherein the dummy pilot signal is transmitted from the CDMA-2000 system located in a border area between the WCDMA network and the CDMA-2000 network.

16. The method as claimed in claim 11, wherein the dummy pilot signal includes a specific scramble code.

17. The method as claimed in claim 11, wherein the
5 WCDMA system comprises:

a radio transceiver subsystem (RTS) for receiving the level value of the dummy pilot signal from the multimode terminal and transmitting the level value of the dummy pilot signal; and

10 a radio network controller for receiving the level value of the dummy pilot signal from the radio transceiver subsystem, determining whether to perform the handover for the multimode terminal, and transmitting the handover request message or the handover command message.

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18. The method as claimed in claim 11, wherein the CDMA-2000 system includes:

a base transceiver station (BTS) for transmitting the dummy pilot signal to the multimode terminal; and

20 a base station controller (BSC) for receiving the handover request message from the WCDMA system.

19. The method as claimed in claim 11, wherein, in step a), the multimode terminal periodically searches a
25 common pilot channel (CPICH) and receives the WCDMA signal level measurement message.

20. The method as claimed in claim 11, in step f),
when the multimode terminal receives the handover command
message, the CDMA-2000 modem of the multimode terminal is
5 turned on and a WCDMA modem of the multimode terminal is
turned off.

21. A system for performing a handover from a WCDMA
network to a CDMA-2000 network by means of a dummy pilot
10 signal, the system comprising:

a multimode terminal for receiving a WCDMA signal
level measurement message, turning on a CDMA-2000 modem
embedded in the multimode terminal and transmitting a level
value of the dummy pilot signal, when detecting the dummy
15 pilot signal above a prescribed level out of the WCDMA
signal level measurement message;

a WCDMA system for receiving the level value of the
dummy pilot signal from the multimode terminal, determining
whether to perform the handover, and transmitting a handover
20 request message or a handover command message; and

a CDMA-2000 system for transmitting the dummy pilot
signal to the multimode terminal.

22. The system as claimed in claim 21, further
25 comprising a protocol converter for converting a protocol of
messages transferred between the WCDMA system and the CDMA-

2000 system.

23. The system as claimed in claim 21, wherein the multimode terminal is capable of using both synchronous
5 CDMA-2000 service and an asynchronous WCDMA service and uses at least two frequency bands.

24. The system as claimed in claim 21, wherein, when the multimode terminal receives the handover command message,
10 traffic is switched to the CDMA-2000 modem of the multimode terminal.

25. The system as claimed in claim 21, wherein the WCDMA signal level measurement message includes information
15 on peripheral base stations which should be searched by the multimode terminal and information on the dummy pilot signal.

26. The system as claimed in claim 21, wherein the
20 dummy pilot signal includes a WCDMA pilot signal.

27. The system as claimed in claim 21, wherein the dummy pilot signal is transmitted from the CDMA-2000 system located in a border area between the WCDMA network and the
25 CDMA-2000 network.

28. The system as claimed in claim 21, wherein the dummy pilot signal includes a specific scramble code.

29. The system as claimed in claim 21, wherein the
5 WCDMA system includes:

a radio transceiver subsystem (RTS) for receiving the level value of the dummy pilot signal from the multimode terminal and transmitting the received level value of the dummy pilot signal; and

10 a radio network controller for receiving the level value of the dummy pilot signal from the radio transceiver subsystem, determining whether to perform the handover for the multimode terminal, and transmitting the handover request message or the handover command message.

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30. The system as claimed in claim 21, wherein the CDMA-2000 system includes:

a base transceiver station (BTS) for transmitting the
dummy pilot signal to the multimode terminal; and

20 a base station controller (BSC) for receiving the handover request message from the WCDMA system.

31. The system as claimed in claim 21, wherein the multimode terminal periodically searches a common pilot
25 channel (CPICH) and receives the WCDMA signal level measurement message.

32. The system as claimed in claim 21, wherein, when the multimode terminal receives the handover command message, the CDMA-2000 modem of the multimode terminal is turned on
5 and a WCDMA modem of the multimode terminal is turned off.

33. A WCDMA system for performing a handover from a WCDMA network to a CDMA-2000 network by means of a dummy pilot signal, the WCDMA system comprising:
10 a radio transceiver subsystem (RTS) for receiving a level value of the dummy pilot signal from a multimode terminal and transmitting the received level value of the dummy pilot signal; and
a radio network controller for receiving the level
15 value of the dummy pilot signal from the radio transceiver subsystem, determining whether to perform the handover for the multimode terminal, and transmitting a handover request message or a handover command message.

20 34. The WCDMA system as claimed in claim 33, wherein the multimode terminal is capable of using both synchronous CDMA-2000 service and asynchronous WCDMA service and uses at least two frequency bands.

25 35. The WCDMA system as claimed in claim 33, wherein, when the multimode terminal receives the handover command

message, traffic is switched to a CDMA-2000 modem of the multimode terminal.

36. The WCDMA system as claimed in claim 33, wherein
5 the dummy pilot signal includes a WCDMA pilot signal.

37. The WCDMA system as claimed in claim 33, wherein the dummy pilot signal includes a specific scramble code.

10 38. The WCDMA system as claimed in claim 33, wherein, when the multimode terminal receives the handover command message, a CDMA-2000 modem of the multimode terminal is turned on and a WCDMA modem of the multimode terminal is turned off.

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39. A CDMA-2000 system for performing a handover from a WCDMA network to a CDMA-2000 network by means of a dummy pilot signal, the CDMA-2000 system comprising:

20 a base transceiver station (BTS) for transmitting the dummy pilot signal, which is a WCDMA pilot signal including a specific scramble code assigned in advance, to the multimode terminal; and

a base station controller (BSC) for receiving a handover request message from a WCDMA system.

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40. The CDMA-2000 system as claimed in claim 39,

wherein the multimode terminal is capable of using both synchronous CDMA-2000 service and an asynchronous WCDMA service and uses, at least two frequency bands.

5 41. The CDMA-2000 system as claimed in claim 39, wherein, when the multimode terminal receives a handover command message, traffic is switched to a CDMA-2000 modem of the multimode terminal.

10 42. The CDMA-2000 system as claimed in claim 39, wherein, when traffic is switched to a CDMA-2000 modem, the multimode terminal turns off a WCDMA modem mounted on an inside of the multimode terminal.

15 43. The CDMA-2000 system as claimed in claim 39, wherein the multimode terminal periodically searches a common pilot channel (CPICH) and receives the dummy pilot signal.

20 44. The CDMA-2000 system as claimed in claim 39, wherein, when the multimode terminal receives a handover command message, a CDMA-2000 modem of the multimode terminal is turned on and a WCDMA modem of the multimode terminal is turned off.

25 45. A multimode terminal capable of using both

synchronous CDMA-2000 service and asynchronous WCDMA service and using at least two frequency bands, the multimode terminal comprising:

an RF antenna for transmitting/receiving CDMA-2000
5 signals and/or WCDMA signals;

an RF transmission/reception unit for receiving and demodulating a dummy pilot signal sent from the RF antenna, and outputting a demodulated dummy pilot signal;

a pilot signal measurement unit for measuring
10 intensity of the demodulated dummy pilot signal;

a WCDMA modem and a CDMA-2000 modem for processing a digital signal received from the RF transmission/reception unit and performing a call processing according to protocols respectively defined in a WCDMA standard and a CDMA-2000
15 standard;

a flash memory for storing an inter-modem switching program for performing a switching between the WCDMA modem and the CDMA-2000 modem according to a command from a WCDMA system; and

20 a controller for turning on the CDMA-2000 modem and controlling a level value of the dummy pilot signal to be transmitted to the WCDMA system, when the dummy pilot signal above a specific level is detected.

25 46. The multimode terminal as claimed in claim 45, wherein, when the multimode terminal receives a handover

command message from the WCDMA system, the controller loads the inter-modem switching program, controls the CDMA-2000 modem to be turned on, and controls the WCDMA modem to be turned off.

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47. The multimode terminal as claimed in claim 45, wherein the dummy pilot signal includes a WCDMA pilot signal.

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48. The multimode terminal as claimed in claim 45, wherein the dummy pilot signal is transmitted from a CDMA-2000 system located in a border area of a WCDMA network and a CDMA-2000 network.

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49. The multimode terminal as claimed in claim 45, wherein the dummy pilot signal includes a specific scramble code assigned in advance.

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50. The multimode terminal as claimed in claim 45, wherein the WCDMA system comprises:

a radio transceiver subsystem (RTS) for receiving the level value of the dummy pilot signal from the multimode terminal and transmitting the received level value of the dummy pilot signal; and

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a radio network controller for receiving the level value of the dummy pilot signal from the radio transceiver

subsystem, determining whether to perform the handover for the multimode terminal, and transmitting a handover request message or a handover command message.

- 5 51. The multimode terminal as claimed in claim 45, wherein the multimode terminal periodically searches a common pilot channel (CPICH) and receives the CDMA-2000 signals and/or the WCDMA signals.